Fl. China 19: 282–287. 2011.

66. PAEDERIA Linnaeus, Syst. Nat., ed. 12, 2: 135, 189; Mant. Pl. 1: 7, 52. 1767, nom. cons.

鸡矢藤属 ji shi teng shu

Chen Tao (陈涛); Charlotte M. Taylor

Daun-contu Adanson.

Shrubs, subshrubs, or vines, unarmed, usually extensively twining, usually with fetid odor when bruised. Raphides present. Leaves opposite or infrequently in whorls of 3 or 4, without or sometimes with (*Paederia foetida*, *P. spectatissima*) pubescent domatia; stipules caducous or persistent, interpetiolar, triangular to bilobed. Inflorescences axillary and/or terminal on main stem or often on short lateral stems, thyrsiform, paniculate, cymose, or spiciform, several to many flowered, sessile to pedunculate, bracteate with bracts sometimes enlarged and stipitate [to petaloid]. Flowers sessile to pedicellate, bisexual, monomorphic. Calyx limb (4 or)5(or 6)-lobed [sometimes with calycophylls]. Corolla white, pink, or purple, funnelform to salverform usually with tube very slender then abruptly enlarged shortly above base, inside pubescent in tube and throat, sometimes fenestrate near base; lobes (4 or)5(or 6), induplicate-valvate in bud, with margins often crisped to irregular, rarely shortly trifid at apex. Stamens (4 or)5(or 6), included, inserted at various levels near middle of corolla tube, included; filaments reduced [or sometimes developed]; anthers dorsifixed. Ovary 2(or 3)-celled, ovules 1 in each cell, erect, basal, anatropous; stigmas 2, filiform, included or exserted. Fruit characteristic: dry, drupaceous becoming schizocarpous, globose or compressed globose to compressed ellipsoid, with calyx limb persistent and occasionally becoming enlarged; exocarp dry, membranous to papery, usually drying shiny, at maturity fragmenting; pyrenes ("diaspores") 2(or 3), indehiscent, membranous to leathery, hemispherical to flattened, oblong to ovate in outline, entire to winged, rarely pubescent (*P. yunnanensis*), sometimes borne on a persistent carpophore; seeds with testa thin; cotyledons broadly cordate; radicle short, hypogeous.

Thirty species: tropical and subtropical Africa, Asia, Madagascar, North America (Mexico), and South America; nine species (three endemic) in China.

Paederia was studied in detail by Puff and collaborators (in Puff, Opera Bot. Belg. 3: 1–376. 1991). They recognized three subgenera based on corolla morphology and size, anther position, style length, the presence of petaloid bracts, and fruit morphology. Two of their subgenera are found in China: *P.* subg. *Paederia*, which is restricted to SE Asia and includes *P. cavaleriei*, *P. foetida*, *P. pertomentosa*, and *P. stenobotrya*; and *P.* subg. *Alatopaederia* Puff, which is found worldwide except continental Africa and includes the remaining Chinese species. Puff (loc. cit.: 207–292) presented a species-level taxonomy of Asian *Paederia* that differed significantly from that of other authors, including W. C. Ko (in FRPS 71(2): 110–119. 1999). In particular, he recognized fewer species, circumscribed *P. foetida* more widely, and accordingly synonymized several names. Puff also applied the name *P. foetida* differently than previous authors, and his conclusions were not adopted in FRPS: he applied the name *P. foetida* to plants treated by W. C. Ko (loc. cit.: 118–119) as *P. scandens*, and he included the plants treated as *P. foetida* by W. C. Ko (loc. cit.: 112–113) in *P. cruddasiana*. Puff (loc. cit.: 216–220) discussed in detail the confusion of these species and the typification of *P. foetida* and synonymized *P. scandens* under *P. foetida*. The treatment here follows Puff, which is well documented and internally consistent, and thus is distinct from traditional taxonomy of SE Asian *Paederia*.

The fruit of *Paederia* are unusual in Rubiaceae: they are drupaceous in structure but dry and tardily schizocarpous with the exocarp fragmenting to expose the two pyrenes, which are the dispersal unit or diaspores, sometimes simply enclosed in the fruit and sometimes borne on carpophores (Puff, loc. cit.: 1–376). *Paederia* species are best distinguished by fruit characters; determinations of flowering specimens are usually provisional. The corollas of most species of *Paederia* have a notable size range, sometimes varying by 100–200. *Paederia foetida* is by far the most commonly collected Asian species of the genus and one of the most commonly collected species of Rubiaceae in China. The descriptions below follow Puff (loc. cit.: 207–292) in describing primarily what he termed the "mid-stem region," i.e., the mature stems below the apical, young region. Inflorescence morphology was used by Puff in part to distinguish species; however, these are indeterminate and in several species continue to grow. In particular, their axes continue to elongate for some time during the flowering period; thus, if inflorescences of different ages are compared these characters can be problematic to interpret. W. C. Ko (loc. cit.: 111) described the anthers as basifixed or dorsifixed, but Puff (loc. cit.) reported them as dorsifixed.

Key to fruiting material

1a. Fruit globose to subglobose, 4–7 mm in diam.; pyrenes hemispherical to concavo-convex or plano-convex.
  2a. Inflorescences paniculate, thyrsiform, corymbiform, or cymose, usually branched to several orders and with flowers in open cymose groups, dichotomous or frequently with higher order axes scorpioid; stipules 1.5–6 mm ..... 3. *P. foetida*
  2b. Inflorescences narrowly paniculate, racemiform, or spiciform, branched to 1 or several orders and with flowers in congested groups to small heads, axes when developed usually dichotomously branched; stipules 2–12 mm.
    3a. Stipules 2–3.5 mm; calyx lobes 0.6–1 mm ..... 5. *P. pertomentosa*
    3b. Stipules 4–12 mm; calyx lobes 0.4–2 mm.
      4a. Calyx lobes 0.4–1 mm; leaf margins flat or often finely and extensively crisped; plants of mainland and Taiwan ..... 1. *P. cavaleriei*
      4b. Calyx lobes 1–2 mm; leaf margins flat; plants of mainland and Hainan ..... 8. *P. stenobotrya*

1b. Fruit orbicular, ovoid, or ellipsoid, rounded to strongly flattened, 5–15.5 × 4.5–11 mm; pyrenes flattened, orbicular, ovate, or elliptic in outline, sharply edged to marginally winged.
5a. Stipules 1–1.5 mm; fruit 10–11 mm wide, flattened; pyrenes papery; calyx lobes 0.3–0.6 mm; inflorescence branched to several orders, becoming diffuse with well-developed axes, these usually ascending ..... 7. *P. spectatissima*
5b. Stipules 2.5–25 mm; fruit 4.5–10 mm wide, rounded to flattened (if stipules less than 4 mm then fruit 4.5–8 mm wide); calyx lobes 0.5–2 mm.
6a. Stipules 9–25 mm.
7a. Fruit 5–7 mm; calyx lobes 0.5–0.8 mm ..... 6. *P. praetermissa*
7b. Fruit 6–9 mm; calyx lobes 0.5–1.7 mm ..... 9. *P. yunnanensis*
6b. Stipules 2.5–8.9 mm.
8a. Stipules 2.5–6 mm ..... 2. *P. cruddasiana*
8b. Stipules 4–8.9 mm.
9a. Fruit 9–15 × 7–9 mm ..... 4. *P. lanuginosa*
9b. Fruit 6–9 × 5–7 mm ..... 9. *P. yunnanensis*

Key to flowering material

1a. Well-developed inflorescences paniculate, thyrsiform, corymbiform, or cymose, usually branched to several orders (up to 10) and with flowers borne separated in open cymose groups, with axes dichotomous or frequently higher order axes scorpioid; stipules 1–6 mm.
2a. Inflorescences becoming diffuse, axes mostly dichotomously branched, well developed, and ascending; stipules 1–1.5 mm ..... 7. *P. spectatissima*
2b. Inflorescences small to extensive and spreading, with axes dichotomously branched and/or often highest order axes markedly scorpioid; stipules 1.5–6 mm.
3a. Flowers generally borne in small rather congested groups; calyx lobes 0.4–2 mm; corolla lobes 2–4 mm; pyrenes somewhat flattened ..... 2. *P. cruddasiana*
3b. Flowers generally borne in branched cymules; calyx lobes 0.4–1 mm; corolla lobes 1–2 mm; pyrenes hemispherical ..... 3. *P. foetida*
1b. Well-developed inflorescences paniculate, racemiform, or spiciform, branched to 1 to several orders and with flowers usually congested in small groups or heads, with axes short and dichotomously branched or sometimes unbranched; stipules 2–25 mm.
4a. Calyx limb with short tube and lobes deltoid and ± equal in length to tube; stipules 9–25 mm ..... 6. *P. praetermissa*
4b. Calyx limb lobed to base or with very short tube, lobes linear, ovate, suborbicular, or triangular and longer than tube; stipules 2–15 mm.
5a. Stipules 2–3.5 mm; leaves usually with sides generally parallel; inflorescences with secondary axes often not developed ..... 5. *P. pertomentosa*
5b. Stipules 4.5–15 mm; leaves generally with sides curved; inflorescences with secondary axes at least shortly developed.
6a. Corolla tube 15.5–17.5 mm ..... 4. *P. lanuginosa*
6b. Corolla tube 4–10.5 mm.
7a. Plants of mainland and Hainan; leaves 6–17 × 3–7 cm; corolla tube 5–6 mm; fruit usually drying orange-yellow; pyrenes plano-convex or concavo-convex ..... 8. *P. stenobotrya*
7b. Plants of mainland and Taiwan; leaves 6–22 × 2.5–13 cm; corolla tube 4–10.5 mm; fruit drying straw-yellow to brown, gray, or black; pyrenes plano-convex to concavo-convex or flattened.
8a. Leaf margins flat or often finely crisped; stems densely hirsute, hirtellous, pilosulous, and/or tomentose to glabrescent; calyx lobes 0.4–1 mm; pyrenes plano-convex to concavo-convex ..... 1. *P. cavaleriei*
8b. Leaf margins flat; stems densely tomentulose and/or hirtellous to glabrescent; calyx lobes 0.5–1.7 mm; pyrenes flattened ..... 9. *P. yunnanensis*

1. Paederia cavaleriei H. Léveillé, Repert. Spec. Nov. Regni Veg. 13: 179. 1914.

耳叶鸡矢藤 er ye ji shi teng

Vines, to 4 m; stems densely hirsute and/or hirtellous, pilosulous, or tomentulose to glabrescent, drying brown. Leaves opposite; petiole 2–8(–21) cm, densely hirsute or hirtellous to glabrescent; blade drying submembranous to papery, ovate, oblong-ovate, lanceolate, rhombic-ovate, or oblong, 6–18(–22) × 2.5–10(–13) cm, adaxially sparsely to densely strigillose, hirtellous, hirsute, or scabrous, abaxially sparsely to densely pilosulous to hirtellous with pubescence denser on veins, base rounded or truncate to cordulate or usually cordate, margin flat or usually densely finely crisped and often appearing denticulate, apex acute to long acuminate; secondary veins 5–10 pairs; stipules generally persistent, triangular to lanceolate, 5–12 mm, acute to acuminate. Inflorescences axillary and/or terminal, paniculate to racemiform, cylindrical to narrowly pyramidal, 7–

20(–30) cm, branched to 2–4 orders, densely hirtellous, pilosulous, or hirsute, pedunculate; bracts triangular to linear, 1–3 mm; pedicels to 1 mm. Flowers sessile to pedicellate in congested cymules or small heads. Calyx puberulent to glabrous; hypanthium portion ellipsoid to turbinate, 1–1.6 mm; limb lobed nearly to base; lobes triangular, 0.4–1 mm. Corolla pinkish gray, lilac gray, grayish white, or purplish green, tubular-funnelform, outside densely mealy tomentose or mealy puberulent; tube 4–10 × 2.5–4.5 mm, without slits; lobes broadly triangular to broadly ovate, 1–2 mm, obtuse to acute. Fruit globose, 4.5–5 × 4.5–5 mm, puberulent to glabrous, drying straw-yellow; pyrenes plano-convex to concavo-convex. Fl. Apr–Aug, fr. Aug–Nov.

● Thickets on mountains; 100–3000 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, ?Sichuan, Taiwan [?Laos].

2. Paederia cruddasiana Prain, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 67: 295. 1898.

臭鸡矢藤 chou ji shi teng

Paederia cruddasiana subsp. *microcarpa* (Kurz) Puff; *P. foetida* Linnaeus var. *microcarpa* Kurz.

Vines, to 10 m; stems moderately to sparsely hirtellous or strigillose to glabrous, drying yellowish brown. Leaves opposite; petiole 1–3 cm, hirtellous or strigillose to glabrescent; blade drying membranous, ovate, lanceolate, or narrowly lanceolate, 5–16 × 2–10.5 cm, adaxially glabrous or puberulent on principal veins, abaxially sparsely hirtellous to glabrous on blade and sparsely to moderately puberulent or hirtellous along veins, base rounded to truncate or cordate, margins flat, apex acute to weakly acuminate; secondary veins 4–8 pairs; stipules generally persistent, ovate-lanceolate to broadly triangular, 2.5–6 mm, acute or bifid. Inflorescences axillary and/or terminal, paniculate, pyramidal, 6–50 cm, branched to 3–5 orders, hirtellous to glabrescent, pedunculate; bracts triangular to linear, 0.5–2 mm; pedicels to 2 mm. Flowers subsessile to pedicellate in cymules. Calyx puberulent to glabrescent; hypanthium portion ellipsoid, ca. 1 mm; limb lobed nearly to base; lobes triangular, 0.4–2 mm. Corolla purplish blue, lilac, or pink, funnelform, outside densely puberulent to tomentulose; tube 6–16 × 1.5–4.5 mm, without slits; lobes triangular, 2–4 mm. Fruit broadly ellipsoid to ovoid, somewhat laterally compressed, 6–11 × 4.5–8 mm, glabrescent, drying yellowish gray; pyrenes ovate to elliptic, somewhat flattened, marginally winged. Fl. May–Jun, fr. Nov–Dec.

Open forests; 100–1900 m. Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal, Thailand, Vietnam].

This species has long been incorrectly treated by several previous authors as *Paederia foetida*, including by W. C. Ko (in FRPS 71(2): 112–113. 1999); see comments above in the genus discussion. Puff (Opera Bot. Belg. 3: 251–252. 1991) recognized two subspecies of *P. cruddasiana*, distinguished by fruit and pyrene size and form, and included some Chinese plants in subsp. *cruddasiana* and others in subsp. *microcarpa*. The distribution of these subspecies is apparently complementary (Puff, loc. cit.: 252, f. 11), with the plants in the SE range of this species falling into subsp. *microcarpa*; however, the measurements that separate these taxa are overlapping generalizations, based on study of ten collections of subsp. *cruddasiana* and four collections of subsp. *microcarpa* from China, with several collections of each subspecies apparently found in the same relatively small region (e.g., *Mengla Exped. 34288*, subsp. *microcarpa*, and *Li Y. H. 317*, subsp. *cruddasiana*, both reported as 21°30’N 101°25’E; this latter collection apparently not mapped in his f. 11). Given the large morphological variation documented within other species of *Paederia*, the few specimens studied by Puff, and the geographic overlap, these varieties are provisionally not recognized here pending further study.

3. Paederia foetida Linnaeus, Syst. Nat., ed. 12, 2: 189; Mant. Pl. 1: 52. 1767.

鸡矢藤 ji shi teng

Gentiana scandens Loureiro; *Paederia chinensis* Hance; *P. dunniana* H. Léveillé; *P. esquirolii* H. Léveillé; *P. laxiflora* Merrill ex H. L. Li; *P. mairei* H. Léveillé; *P. scandens* (Loureiro) Merrill; *P. scandens* f. *mairei* (H. Léveillé) Nakai; *P. scandens* var. *mairei* (H. Léveillé) H. Hara; *P. scandens* var. *tomentosa* (Blume) Handel-Mazzetti; *P. tomentosa* Blume; *P. tomentosa* var. *glabra* Kurz; *P. tomentosa* var. *mairei* (H. Léveillé) H. Léveillé; *P. stenophylla* Merrill.

Vines, to 5 m; stems glabrous to densely puberulent, hirtellous, or pilosulous often becoming glabrescent, drying gray to brown. Leaves opposite or rarely ternate; petiole 0.5–9 cm, glabrous to densely hirtellous or pilosulous; blade drying papery to subleathery, ovate, ovate-oblong, lanceolate, lanceolate-elliptic, or elliptic, (1–)5–9(–21) × 1–4(–9) cm, adaxially glabrous to puberulent at least on principal veins, abaxially glabrous to puberulent, hirtellous, or strigillose at least on principal veins, base cuneate, rounded, truncate, or sometimes cordulate to cordate, margins flat, apex acute or acuminate; secondary veins 4–6 pairs; stipules generally persistent, triangular to ovate, 1.5–6 mm, obtuse to acute, acuminate, or rarely bifid. Inflorescences axillary and/or terminal, paniculate, thyrsiform, corymbiform, or cymose, pyramidal to rounded, 5–100 cm, branched to 2–5 orders with higher order axes dichotomous or often scorpioid, hirtellous, strigillose, or glabrous, pedunculate; bracts lanceolate to triangular, 0.8–3 mm; pedicels to 1.5 mm. Flowers sessile to pedicellate in dichotomous to scorpioid, lax to somewhat congested cymules. Calyx glabrous to densely puberulent; hypanthium portion turbinate to ellipsoid, 0.8–2 mm; limb deeply lobed; lobes triangular, 0.4–1 mm. Corolla pale purple, grayish pink, lilac, or grayish white, funnelform, outside densely mealy puberulent or mealy tomentulose; tube (5–)7–10(–17) × 2–6 mm, without slits; lobes broadly triangular to ovate, 1–2 mm, acute. Fruit globose, 4–7 × 4–7 mm, glabrescent, drying gray to yellow; pyrenes concavo-convex to plano-convex. Fl. May–Oct, fr. Jul–Dec.

Forests, forest margins, thickets in ravines and on mountain slopes; 200–2000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Jiangsu, Jiangxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bangladesh, Bhutan, Borneo, Cambodia, India, Indonesia, Japan, N Korea, Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam; also occasionally cultivated, and naturalized in United States (Florida) and perhaps Sri Lanka].

Paederia foetida is naturalized in a few places around the world and apparently quite weedy wherever it grows; in particular, it has been reported as an adventive and sometimes a problem weed in Florida, where it is called “skunk vine.”

Puff (Opera Bot. Belg. 3: 207–292. 1991) substantially changed

and clarified the application of this name; see the discussion under the genus above. *Paederia foetida* as circumscribed by Puff (and here) is widespread and morphologically widely variable but with continuous morphological variation, as documented in detail (loc. cit.: 223–224, f. 4, f. 5). W. C. Ko (in FRPS 71(2): 118–119. 1999) recognized two varieties within this species (treated as *P. scandens*), with the stems and leaves glabrous or subglabrous in var. *scandens* and subglabrous to pubescent in var. *tomentosa*; Ko reported var. *scandens* from throughout the range of this species in China and var. *tomentosa* only from "Jiangxi, Guangdong, Hong Kong, Hainan, Guangxi, Yunnan." Puff synonymized these based on his conclusion that pubescence varies continuously within this species and thus does not distinguish separate evolutionary lineages.

Puff synonymized *Paederia stenophylla* with *P. foetida*, and this name is provisionally listed in synonymy here. The name *P. stenophylla* seems to have been applied by W. C. Ko (loc. cit.: 115) at least in part to plants that Puff treated as *P. pertomentosa* rather than *P. foetida*, and Puff reported that he did not see the type of *P. stenophylla*; this situation may deserve re-consideration, but that work is outside the scope of this current project.

The name *Paederia dunniana* from Guizhou was apparently overlooked by Puff; this was reported by Lauener and Ferguson (Notes Roy. Bot. Gard. Edinburgh 32: 112. 1972) to be a synonym of *"P. scandens,"* which corresponds to *P. foetida* here, and this name is accordingly synonymized here provisionally.

4. Paederia lanuginosa Wallich, Pl. Asiat. Rar. 2: 52. 1831.

绒毛鸡矢藤 rong mao ji shi teng

Hondbesseion lanuginosum (Wallich) Kuntze; *Paederia macrocarpa* Wallich.

Vines, to 12 m; stems densely tomentose to glabrescent, drying dark brown. Leaves opposite; petiole 3.5–12 cm, densely tomentose; blade elliptic to oblong-elliptic, 8–20 × 4.5–15 cm, adaxially sparsely to moderately strigillose with pubescence denser on midrib, abaxially densely tomentulose, base cordate to subrounded, margins flat, apex acuminate; stipules caducous often by fragmentation, triangular, 4.5–8.5 × 2.3–5.5 mm, acute to bifid. Inflorescences axillary on main stems and/or terminal on lateral stems, paniculate, densely tomentulose, pedunculate. Flowers subsessile in small heads. Calyx densely tomentulose; hypanthium portion turbinate to subglobose, 1.6–2.5 mm; limb deeply lobed; lobes triangular to suborbicular, 1–1.4 mm. Corolla pale green, dull white, pink, reddish purple, or dark purple, funnelform, outside densely tomentulose; tube 15–17.5 × 3.5–4.5 mm, with slits at base; lobes broadly triangular, 2.7–4 mm, acuminate, marginally crisped. Fruit oblong-elliptic, laterally flattened, 9–15 × 7–9 mm, subglabrous, drying brown; pyrenes elliptic to ovate in outline, flattened, marginal wing 1–2 mm wide. Fl. Jun–Jul, fr. Aug–Feb.

Open forests or thickets, twining on other shrubs and small trees; sea level to 1900 m. Yunnan [Myanmar, Thailand].

Puff (Opera Bot. Belg. 3: 207–292. 1991) noted that this species has the largest leaves of the genus, as well as notably large flowers and fruit, and sometimes has "conspicuously fissured bark" that is also distinctive. W. C. Ko (in FRPS 71(2): 114. 1999) described the corolla lobes as 3-lobed, but this has not been mentioned by any other authors.

5. Paederia pertomentosa Merrill ex H. L. Li, J. Arnold Arbor. 24: 458. 1943.

白毛鸡矢藤 bai mao ji shi teng

Vines or clambering subshrubs, to 5 m; stems densely pilosulous to tomentulose, when dry dark straw-yellow. Leaves opposite; petiole 1–5 cm, densely pilosulous or hirtellous and/or tomentulose; blade drying papery, ovate-elliptic, lanceolate-oblong, or oblong-elliptic, 5–15 × 2–6 cm, adaxially moderately to densely pilosulous to strigillose with pubescence denser along midrib, abaxially densely white tomentulose, base obtuse, rounded, truncate, or cordulate, margins flat, apex acute to acuminate; secondary veins 6–8 pairs; stipules generally persistent, triangular, 2–3.5 mm, acute to weakly acuminate. Inflorescences axillary and/or terminal, spiciform to paniculate, cylindrical to narrowly pyramidal, 15–50 cm, branched to 1–3 orders with ultimate axes often very short, densely pilosulous to tomentulose, pedunculate; bracts triangular, 1–4 mm. Flowers sessile or subsessile in congested cymules or small heads. Calyx densely pilosulous to tomentose; hypanthium portion turbinate to ellipsoid, ca. 1 mm; limb lobed nearly to base; lobes triangular, 0.6–1 mm. Corolla lilac, grayish pink, or grayish purple, tubular-funnelform, outside densely papillose to puberulent; tube 5–8 × 2–3 mm, without slits; lobes ovate to triangular, 1–1.5 mm, acute, margins flat to crisped. Fruit globose to subglobose, 4–7 × 4–7 mm, glabrous, drying straw-yellow; pyrenes plano-convex or concavo-convex. Fl. May–Aug, fr. Jul–Nov.

● Forests, thickets, often on limestone; 200–1400 m. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi.

6. Paederia praetermissa Puff, Opera Bot. Belg. 3: 273. 1991.

奇异鸡矢藤 qi yi ji shi teng

Vines, to 5 m; stems densely hirsute to hirtellous becoming glabrescent, drying brownish gray. Leaves opposite; petiole 1.5–8 cm, moderately to densely hirsute, hirtellous, or pilosulous; blade drying papery to subleathery, ovate-elliptic or lanceolate, 6–22 × 3.5–12 cm, adaxially sparsely hirtellous or hispidulous to glabrescent, abaxially densely pilose to hirtellous or tomentose, base cordulate to cordate, margins flat, apex acute to acuminate; secondary veins ca. 8 pairs; stipules caducous, triangular to lanceolate, 9–25 × 5–13 mm. Inflorescences terminal on lateral stems and/or axillary on main stems, paniculate, pyramidal to cylindrical, 8–20 cm, branched to 2–4 orders, densely hirsute to hirtellous or pilosulous, pedunculate; bracts linear to triangular. Flowers subsessile. Calyx densely pilosulous to hirtellous; hypanthium portion ellipsoid, 1–1.4 mm; limb lobed for ca. 1/2; lobes narrowly lanceolate or linear-lanceolate, 0.5–0.8 mm. Corolla grayish purple to pink, funnelform, outside densely puberulent or scabridulous; tube 4.5–9 × 1.2–1.5 mm, without slits; lobes ovate-elliptic, 1.5–2.5 mm, acute to minutely trifid, margins crisped. Fruit brown, ellipsoid to ovoid, laterally somewhat compressed, 5–7 × 5–6 mm, sparsely to moderately pilosulous to hirtellous to glabrescent; pyrenes ovate to elliptic in outline, flattened, marginal wing 0.8–1 mm wide. Fl. Jun–Jul or Oct–Nov, fr. Dec–Jan.

Sparse forests or thickets; 600–1300 m. Yunnan [Myanmar, Thailand, ?Vietnam].

7. Paederia spectatissima H. Li, Novon 9: 220. 1999.

云桂鸡矢藤 yun gui ji shi teng

Vines, twining, to 12 m; stems glabrous, drying dark red then grayish brown. Leaves opposite; petiole 1–4 cm, glabrous; blade drying leathery to papery, ovate-elliptic to elliptic, 6–12 × 3–6 cm, glabrous on both surfaces, base cuneate to obtuse, margins flat, apex acuminate with tip usually prolonged; secondary veins 6–10 pairs; stipules persistent or caducous, broadly triangular, 1–1.5 mm, obtuse to shortly acuminate. Inflorescences axillary and/or terminal, paniculate, pyramidal to cylindrical, 20–100 cm, branched to 6–10 orders, papillose, puberulent, or glabrescent, pedunculate; bracts triangular, 1–2 mm. Flowers sessile or subsessile. Calyx densely puberulent; hypanthium portion ellipsoid, 1–1.5 mm; limb 0.8–1 mm, lobed for ca. 1/2; lobes triangular, 0.3–0.6 mm. Corolla greenish to purplish white, funnelform, densely papillose-puberulent to scabrid-papillose outside; tube 5–8 × 2.6–3.7 mm, with slits at base; lobes triangular, 1.7–2.4 mm, acute, margins often crisped. Fruit orbicular, flattened laterally, 10–11 × 10–11 mm, puberulent, drying dark gray; pyrenes orbicular in outline, flattened, papery, marginal wing 4–4.5 mm wide. Fl. and fr. Jun–Oct.

Open forests; 800–1000 m. Guangxi, Yunnan (Pingbian) [Vietnam].

W. C. Ko (in FRPS 71(2): 112. 1999) attributed this name to Puff (Opera Bot. Belg. 3: 285. 1991). However, Puff attributed this name to Li in unpublished work and provided no Latin diagnosis or designation of a type, so this name was not validly published by him. Li cited only three collections in her article in Novon and none were specimens cited by Puff, so the specimens cited by Puff do not actually seem to be paratypes as has been suggested.

8. Paederia stenobotrya Merrill, Lingnan Sci. J. 11: 57. 1932.

狭序鸡矢藤 xia xu ji shi teng

Vines, to 3 m; stems densely hirtellous, hirsute-hirtellous, or glabrescent, drying dark yellow. Leaves opposite; petiole 2.5–7 cm, densely hirtellous to tomentose-hirtellous; blade drying papery, ovate, oblong-ovate, or elliptic-ovate, 6–17 × 3–11 cm, adaxially sparsely to moderately scabrid to hirtellous, abaxially hirtellous, pilosulous, or pilose with pubescence denser along veins, base cordate, cordulate, truncate, or rarely acute, margins flat, apex acute to acuminate; secondary veins 5–8 pairs; stipules generally caducous, triangular, 4–10 mm, acute. Inflorescences axillary and/or terminal, spiciform to narrowly paniculate, cylindrical to narrowly pyramidal, 7–30 cm, branched to 1–3 orders, densely hirtellous to hirtellous-tomentose, pedunculate; bracts triangular, 1–2 mm. Flowers sessile in congested cymules or small heads. Calyx densely hirtellous; hypanthium portion turbinate to ellipsoid, 1–1.5 mm; limb lobed nearly to base; lobes subulate to narrowly triangular, 1–2 mm. Corolla funnelform, outside densely hirtellous to tomentulose; tube 5–6 × 2.5–3 mm, without slits; lobes ovate, 1–2 mm. Fruit globose, 5–6 × 5–6 mm, glabrous, drying orange-yellow; pyrenes plano-convex to concavo-convex. Fl. Jun, fr. Jun–Nov.

● Broad-leaved forests on hill slopes; 400–900 m. Fujian, Guangdong, Hainan.

Puff (Opera Bot. Belg. 3: 207–292. 1991) reported this species only from Hainan, but W. C. Ko (in FRPS 71(2): 117. 1999) reported it also from Guangdong and Fl. Fujian. (5: 185. 1993) from Fujian.

9. Paederia yunnanensis (H. Léveillé) Rehder, J. Arnold Arbor. 18: 249. 1937.

云南鸡矢藤 yun nan ji shi teng

Cynanchum yunnanense H. Léveillé, Cat. Pl. Yun-Nan, 13. 1915; *Paederia bodinieri* H. Léveillé (1914–1915), not H. Léveillé (1914); *P. rehderiana* Handel-Mazzetti; *P. tomentosa* Blume var. *purpureocaerulea* H. Léveillé & Vaniot.

Vines, to 7 m; stems densely tomentulose and/or hirtellous becoming glabrescent, drying brown. Leaves opposite; petiole 2–7.5 cm, densely tomentulose and/or pilosulous; blade drying submembranous to papery, ovate, lanceolate, or lanceolate-elliptic, 6–16 × 3–12 cm, adaxially densely strigillose, pilosulous, or scabrous, abaxially densely tomentose to hirtellous, base cordulate to deeply cordate or rarely obtuse, margins flat, apex acute or acuminate; secondary veins 6–8 pairs; stipules generally persistent, lanceolate-triangular to narrowly triangular, 4–15 mm, acute to acuminate or rarely bifid. Inflorescences axillary on main stems and/or terminal on lateral stems, paniculate, cylindrical to narrowly pyramidal, 6–25 cm, branched to 1–3 orders, densely tomentulose to hirtellous or pilosulous, pedunculate or sometimes apparently sessile with basal axes subtended by reduced leaves (or leaflike bracts); bracts linear to narrowly triangular or deeply bilobed, 1.5–6 mm. Flowers sessile and subsessile in congested to subcapitate cymules (sometimes appearing pedicellate when axes of cymes develop later). Calyx with hypanthium portion ellipsoid, 1–1.5 mm, glabrous to puberulent; limb lobed nearly to base; lobes oblong-lanceolate to narrowly triangular, 0.5–1.7 mm, sparsely to densely puberulent, strigillose, or hirtellous. Corolla pale green, pink, reddish purple, or dark purple, tubular-funnelform, outside densely mealy puberulent; tube 5–10.5 × 2.5–5 mm, without slits; lobes broadly triangular, 1–2.5 mm, obtuse to acute, margins crisped. Fruit ovoid, laterally compressed, 6–9 × 5–7 mm, glabrescent, drying brown; pyrenes ovate in outline, flattened, papillose-puberulent, marginal wing ca. 1 mm wide. Fl. Jun–Oct, fr. Jul–Dec.

Forest margins in valleys; 300–3000 m. Guangxi, Guizhou, Sichuan, Yunnan [Vietnam].

Fl. China 19: 282–287. 2011.